

Original Paper

Has Adoption of Inflation Targeting Been Effective? Japanese

Case

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Abstract

Inflation targeting has been adopted in many countries. The pros and cons of adopting this policy have been discussed in developing countries and in developed ones as the goal of this policy has been changing. For most developed economies, combating deflation has been a serious problem, so adopting inflation targeting for this overcoming deflation and recession is ongoing in many developed economies. This paper examines whether or not adoption of inflation targeting has been effective in Japan. Empirical results show that adoption of inflation targeting has promoted overcoming deflation, however, there are no clear results that other important macroeconomic variables have been related directly with this policy.

Keywords

central bank, inflation targeting, monetary policy

1. Introduction

From the start of the 1990s, developing countries and developed countries have adopted inflation targeting as their central banks' policy framework for conducting monetary policy. Some studies have indicated that countries who have adopted inflation targeting have caused good economic performance (Kurihara, 2012; Cespedes, Chang, & Velasco, 2014). However, the empirical results are still mixed, and there is no such trend as many countries have adopted inflation targeting.

Price stability has been one of the most important tasks for central banks. Inflation targeting has been researched as it has been considered that inflation targeting can be directly related with price stability. It has been said that there are some successful examples for the cases of developing economies.

The increased interest in inflation targeting might have contributed to the reduction of high inflation rates in the 1970s and 1980s in developing countries or newly industrializing countries. However, this

situation has changed from the beginning of 1990s. Deflation in some developed countries has drastically prevailed. It had and has seriously damaged their economies. Policy makers have tried to overcome the situation, however, most developed countries suffered deflation seriously and recession despite aggressive monetary and fiscal policy. They could not have changed the situation successfully until recently.

In February 1999, the Bank of Japan (BOJ), the Japanese central bank, adopted the zero interest rate policy, which was unprecedented all over the world at that time, to combat deflation and, of course, to boost the economy. In 2000, the zero interest rate policy in Japan was rescinded as the economic situation showed some bright signs of recovery. However, Japan had not completely recovered when the BOJ changed the stance and conducted more a drastic monetary policy called quantitative monetary easing after a long trial time under the low interest rate policy.

Around 2008, a global financial crisis, the Lehman shock, suddenly occurred. It also caused serious economic conditions in Japan. The BOJ increased the purchases of Japanese government bonds aggressively to flow money into the markets, however, declines in stock prices and yen appreciation occurred at the same time. The flown money were not gone into fixed investment. Under this serious condition, the Japanese government changed to a new and drastic policy, called *Abenomics*. Abe is the name of Japan's prime minister. *Abenomics* is distinguished by a set of policies that comprises three arrows, namely: (1) aggressive monetary policy, (2) fiscal consolidation, and (3) growth strategy. In 2013, the BOJ and the Japanese government agreed and published a joint statement. The BOJ started to conduct monetary policy based on the principle that the policy shall be aimed at achieving price stability (combating serious deflation in reality) and contributing to the sound growth of the economy. The BOJ set the price stability target at 2% in terms of the year-to-year rate of change in the Consumer Price Index (CPI) in January 2013. The government would revitalize Japan's economy by conducting macroeconomic policy and formulating measures to strengthen the competitiveness and growth potential. By cooperation between the government and the BOJ, the government would steadily promote measures aimed at the establishment of a sustainable fiscal structure to ensure the credibility of fiscal management (by Cabinet Office, Ministry of Finance, and Bank of Japan, 2013). There was fear that Japanese fiscal debt expansion again began to increase, but Japanese government took this policy. Also, Abe recently announced a nominal GDP target of ¥600trn (from around ¥500trn) by promoting *Abenomics*.

In January 2016, the BOJ applied a negative interest rate of minus 0.1 percent to the policy-rate balances in current accounts held by financial institutions. The BOJ continued to purchase Japanese government bonds so that 10-year yields would remain at around zero percent. The bank also purchases Exchange-Traded Funds (ETFs) and Japan Real Estate Investment Trusts (J-REITs), so their amounts outstanding will increase at annual paces of about 6 trillion yen and about 90 billion yen, respectively. As for commercial paper and corporate bonds, the BOJ will maintain their amounts outstanding at about 2.2 trillion yen and about 3.2 trillion yen, respectively.

In September 2016, the BOJ decided to introduce *quantitative and qualitative monetary easing with yield curve control*, which is a new framework for strengthening monetary easing. The new policy consists of two smaller ideas. The first is yield curve control in which the BOJ controls short-term and long-term interest rates. The second is an inflation-overshooting commitment in which the BOJ expands the monetary base until the year-on-year rate of increase in the observed CPI exceeds 2% and stays above the target in a stable manner.

In general, inflation targeting is a policy by which central banks set the target inflation rate publicly and monetary policy is conducted according to this target (Fountas, Karanasos, & Kim, 2002; Kurihara, 2012). In the past, this policy has been conducted to combat high inflation rate in some developing economies. However, this policy is being used to reduce deflation. Japan is a typical example.

Along with inflation targeting, central banks are responsible for achieving a publicly announced goal for the inflation rate. Recently, about 30 central banks all over the world adopted this framework for the conduct of monetary policy, which has proven effective in most cases (Svensson & Woodford, 2005). Mishkin (2001) also indicated that countries that conduct inflation targeting have achieved a significant reduction in both the rate of inflation and inflation expectations beyond that which would likely have occurred in the absence of inflation targeting.

The pros of the introduction of inflation targeting can be summarized as follows. First, the realization of the central bank's goal of price stability might not be judged accurately in the absence of clear targets. By introducing inflation targeting, market participants can judge whether or not the performance of central banks is adequate. Second, increased clarification and transparency of central banks' goals keeps accountability for financial markets participants. Third, this policy provides stability of the expected inflation rate.

On the other hand, many critical points have been provided. First, because controlling inflation using money stock or exchange rate, etc., may be less effective, and trust in a commitment to inflation targeting may be unstable. Second, targeting may be attained at the sacrifice of other important economic factors which should be tackled or solved. Third, suitable inflation (CPI or PPI, for example) cannot be easily decided concretely.

This paper examines whether or not adoption of inflation targeting has been effective in Japan. There are still few papers that examine the relationship among inflation targeting policy, inflation rate, and some important related economic variables.

After section 1, section 2 provides related exiting studies. Section 3 presents a theoretical view and an empirical method for the examination of the relationship. Section 4 shows the empirical results and analyzes them. Finally, this paper ends with a brief summary.

2. Existing Studies about Inflation Targeting

This study is to examine empirically whether or not the inflation targeting is effective in Japan. There have been some studies presented from the past, but there is no consensus about the validity of introducing inflation targeting.

There are some studies that examine the incentives of introducing inflation targeting. Kurihara (2010) showed that the openness of the economy, the fiscal surplus, and the central bank's independence correlate negatively with the adoption of inflation targeting. Hove, Tchana, and Toubna (2017) showed that macroeconomic variables such as exchange rate gap, output gap, and trade openness explain inflation targeting outcomes.

There is a comparatively larger number of papers that present successful cases of inflation targeting. Lee (2011) showed evidence that inflation targeting succeeded in Colombia, the Czech Republic, Hungary, and Poland to reduce inflation rates. Umar, Dahalan, and Aziz (2016) showed that the Reserve Bank of South Africa adopted inflation targeting framework and could boost the economy. Kruskovic and Maricic (2014) found that the adoption of inflation targeting affects the reduction of the country risk premium by making a more stable macroeconomic environment through a more stable and predictable inflation. Monadjemi and Lodewijks (2014) indicated that inflation targeting was effective prior to the financial crisis around the year of 2008, and a more flexible form of targeting may still be appropriate after the crisis. Parkin (2014) showed that inflation targeting reduced the inflation rate, the variability of inflation, the variability of real GDP growth, and the output gap. However, inflation targeting had no effect on unemployment. Orłowski (2017) suggested that inflation targeting become an effective and credible policy to mitigate potential contagion effects of the worldwide financial crisis.

On the other hand, there are some papers that provide unsuccessful cases. Taguchi and Sohn (2014) demonstrated that only Korea in East Asian economies experiences a reduction in the pass-through effect under inflation targeting adoption. Sweidan and Widner (2014) proved that inflation targeting policy is not an optimum strategy under dependent central banks and immature markets in developing countries as the economies do not react to inflation targeting policy because of the high uncertainty. Sussman and Zohar (2016) suggested that market participants perceive inflation targeting as either less effective around the lower bound or less aggressive when inflation deviates below target.

Inflation targeting has been discussed for the relationship between the inflation targeting and exchange rates. Pontines (2013) suggested that nominal and real effective exchange rate volatility are both lower under conducting inflation targeting countries than countries that do not conduct inflation targeting. Katuslime and Agbola (2018) showed that inflation targeting is an effective monetary policy tool for curbing exchange rate volatility. Ouyang, Rajan, and Li (2016) found that inflation targeting policy seems to have experienced greater real exchange rate volatility. Ambaw and Sim (2018) discovered that there would be no evidence that adopting an inflation targeting regime would be more effective than adopting a fixed exchange rate, and vice versa in promoting FDI inflows. Fazio, Silva, Tabak, and

Cajueiro (2018) showed that inverted U-shaped relationship between inflation targeting and financial stability as function of the institutional quality reflects the two opposing views.

3. Theoretical Background and Empirical Method

3.1 Theoretical Background

As discussed in the previous section, there are some papers presented, but the evaluations are mixed. This paper employs the following multiple regression equation used for measuring the impact of inflation targeting in Japan on macroeconomic performance provided that it was administered of the variables separately as Eroglu, Çinar, and Eroglu (2017).

$$Y_t = \alpha + \beta IT_t + \delta TT_t + \varepsilon_t \quad (1)$$

where Y_t are the macroeconomic variables with performances that are tested, IT_t is the inflation targeting (the value of inflation targeting as the dummy variable is 0 for the pre-targeting period and 1 for the post-targeting period), TT is the time trend, and t denotes time.

In a regression analysis based on equation (1), the coefficient IT variable confers the effect of β inflation targeting on Y variable. Thus, the β parameter is the basic coefficient of this study. Along with least squares, Robust estimation is used to test if the sign and size of this parameter satisfy our expectation.

In the cases of GDP rate, Composite Index change (CI), Exchange rate Change (EXC), and Stock Price rate (STOCK), the coefficients should be positive in Japan such as combating deflation. On the other hand, for the Case of Interest rate (CPI), the coefficient should be negative.

3.2 Data and Empirical Method

The sample period is from 1991 when the *bubble* economy burst, and Japan experienced serious recession since. In Japan, stock prices and land prices rose tremendously from the middle of the 1980s. The sample ends with May 2018. The data is monthly. All of the data are from International Financial Statistics (IMF).

Table 1. Unit Root Test

	ADF	DF-GLS
CPI	-3.134**	-3.379***
CALL	-6.024***	-5.917***
CI	-3.096**	-3.099***
EXC	-2.857*	-2.865***
STOCK	-3.051**	-3.030***

Notes. ***, **, and * denotes significant at 1%, 5%, and 10% respectively.

Estimation was performed using ordinary least squared (OLS) and robust estimation. Adding to the standard OLS method, robust estimation is employed for analysis. Robust estimation is an estimation method which is insensitive to small departures from the idealized assumptions which have been employed to optimize them. If the outlier is simply an extreme observation from the tail of a normal distribution, OLS fits; however, if the outlier is from non-normal measurement error or some other violation of OLS, it compromises the validity of the regression results if a non-robust regression method is employed.

4. Results and Implications

4.1 Deterministic Elements of Inflation Targeting

The results are almost as expected. Conducting inflation targeting in Japan systematically causes an inflation rate increase. On the other hand, for the other macroeconomic variables, the coefficients are expected, but they are not significant.

Table 2. Estimation Results of OLS and Robust Estimation

Method	LS	LS	LS	LS	LS	Robust
Dependent variable	C PI	CALL	CI	EXC	STOCK	CPI
C	-3.24E-05 (-0.147)	0.747 (0.698)	8.19E-05 (0.062)	0.0001 (0.047)	0.0009 (0.207)	-3.72E-05 (-0.195)
CPI (-1)	0.928*** (51.235)					0.939*** (59.753)
CALL (-1)		0.926*** (43.972)				
CI (-1)			0.969*** (71.176)			
EXC (-1)				0.944*** (49.869)		
STOCK (-1)					0.938*** (47.587)	
IT (-1)	0.0009* (1.816)	-0.751 (-0.311)	0.0007 (0.235)	8.06E-05 (0.015)	0.006 (0.587)	0.0007* (0.086)
Adj.R2/Adj.Rw2	0.899	0.857	0.940	0.893	0.890	0.938
D.W.	1.751	1.755	1.189	1.501	1.529	
F-statistic/ Rn2 statistic	1443.459	975.898	2561.731	1362.630	1320.666	3911.115
Prob(F-statistic)	0.000	0.000	0.000	0.000	0.000	0.000
Prob(Rn2 statistic)						

Note. Parentheses are t-statistics. ***, **, and * denote significant at 1, 5, and 10% respectively.

Finally, time trend is included in the equation, but the results are not so robust.

Table 3. Estimation Results Including Time Trend

Method	OLS
Dependent variable	CP
C	0.0007 (1.314)
CPI (-1)	0.919*** (47.524)
IT(-1)	0.017** (2.228)
Time Trend	-4.68E-06 (-1.473)
Adj.R2	0.910
D.W.	1.747
F-statistic	1111.124
Prob(F-statistic)	0.000

Note. Parentheses are t-statistics. ***, **, and * denote significant at 1, 5, and 10% respectively.

5. Conclusions

This paper examined whether or not adoption of inflation targeting has contributed to financial stability. Using financial markets stability's data, central bank policy's data, and macroeconomic data, two empirical methods were used for estimation. Empirical results showed that adoption of inflation targeting has promoted financial markets stability.

In many countries, especially in developed ones, introducing inflation targeting intends to boost the economy under recession. It is, of course, important to examine these issues, but it is also important to see the financial market's stability as financial market stability is strongly related with the sound growth of the economies. The relationship between inflation targeting and sound economic growth is not clear. It is possible that some important factors that this paper misses exist between inflation targeting and economic growth. Financial market stability is one of the candidates. Further study would be necessary to examine the effects of inflation targeting on the economies.

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